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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/758,500	01/14/2004	Hideo Nakamura	TOW-060	5992

959 7590 09/14/2005

LAHIVE & COCKFIELD, LLP.
28 STATE STREET
BOSTON, MA 02109

EXAMINER

ABOAGYE, MICHAEL

ART UNIT	PAPER NUMBER
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1725

DATE MAILED: 09/14/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/758,500	Applicant(s) NAKAMURA ET AL.	
	Examiner Michael Aboagye	Art Unit 1725	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 14 January 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-26 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-26 is/are rejected.
- 7) ☒ Claim(s) 4 and 11 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 14 January 2004 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>1/14/04 & 7/8/05</u> | 6) <input type="checkbox"/> Other: _____ |

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DETAILED ACTION

Drawings

1. Figures 18 - 20 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 4 and 11 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 4 and 11 recite the limitation "said ring -shaped buffer member" in page 35, line 27 and page 38, line 11 in claims 4 and 11 respectively. There is insufficient antecedent basis for this limitation in the claims. Hence the metes and bounds of claims 4 and 11 are vague and indefinite.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claim 8 is rejected under 35 U.S.C. 102(b) as being anticipated by Gentry (US Patent no. 5971247).

Gentry teaches a friction stir welding method of joining an abutment portion by moving a rotating probe relatively along said abutment portion while pressing said probe against one surface of said abutment portion at which an end of a first plate member and an end of a second plate member are butted together (see Figure 3), said friction stir welding method comprising the steps of attaching a buffer member to a backing jig (attention is drawn to the fact that the member 50 and 312(a-c) in figure 3 of Gentry are interpreted as a buffer member and a backing jig respectively) which holds another surface of said abutment portion corresponding to said abutment portion; and performing friction stir welding along said abutment portion by inserting said probe from said one surface of said abutment portion and maintaining a tip of said probe at a position separated from said buffer member while said first plate member and said second plate member are held by said backing jig (abstract, Figure 3 and column 3, line 62 – column 4, line 36).

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

7. Claims 1- 6 and 8 -25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Colligan (US Patent no. 5769306) in view of Franklin et al. (US Patent no. 3229884) and further in view of Smith (US Patent no. 2362505)

Colligan teaches a friction stir welding method and apparatus of joining an abutment portion by moving a rotating probe relatively along said abutment portion while pressing said probe against one surface of said abutment portion at which an end of a first plate member and an end of a second plate member are butted together said friction stir welding method comprising the steps of: attaching a backing jig which holds

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another surface of said abutment portion; performing friction stir welding along said abutment portion by inserting said probe from said one surface of said abutment portion; (see abstract; column 1, line 59 – column 2, line 44 and figure 4(A&B)); wherein said other surface of said abutment portion is in close contact with an outer circumferential surface of said backing jig, and said ends of said first plate member and said second plate member have an identical length (see Figure 4A); said first plate member and said second plate member are welded by said friction stir welding along said abutment portion while a pressing force is applied in a direction substantially perpendicular to a direction of insertion of said probe(see figure 4A). Note Colligan's device like conventional welding apparatus has a holding mechanism to hold the plates together in the horizontal plane so that they don't come apart to enable friction stir welding.

Colligan does not teach, attachment of a buffer member to a backing jig which holds another surface of the abutment portion; deforming said buffer and part of said abutment portion to protrude toward an opening of said backing jig; said backing jig comprising a plurality of divided jigs and said divided jigs are movable back and forth in radial directions, that each of said divided jigs has a circumscribing recessed section; that said first plate member and said second plate member are arranged on said backing jig while said first plate member and said second plate member are relatively expanded as compared with said backing jig.

However Franklin et al. teaches a divided back-up bar composed of a plurality of similar arcuate segments (note, back-up bar, is herein considered as a backing jig),

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attaching a buffer member to a backing jig which holds another surface of said abutment portion so that an opening of said backing jig formed corresponding to said abutment portion is covered therewith (Franklin et al. Figure 2 and column 2, lines 43 – 72), (note the examiner interprets the member 25 of figure 2 dovetailed in the recess on the upper surface of the member 23 of the backing jig 19 as a buffer member, also note that the member 25 integrally combine to form a ring on the backing jig); said divided jigs are movable back and forth in radial direction(see column 1, line 69 – column 2, line 15); said backing jig is flexible, yieldable and extends longitudinally to maintain a tight contact against the plate members at the opposite side of the seam. (column 1, lines 52 – 69). Note therefore that the joining plate members arranged on said backing jig will relatively expanded as compared with said backing jig due to the heat generated during welding.

Franklin et al. does not expressly teach deforming said buffer member and a part of an abutment portion to protrude toward an opening of said backing jig; disengaging only the said backing jig from the abutment portion while said buffer member is forcibly secured to an other surface of said abutment portion after performing a friction stir welding; disengaging said buffer member from said other surface of said abutment portion; and removing said protruding portion protruding from said abutment portion toward said opening.

Smith teaches a backing jig supporting the abutment portion of two plates to be joined by welding; attaching a thin strip of non-metallic material in a groove (note, said thin strip of non-metallic material is herein interpreted by the examiner as a buffer

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member) provide in said backing jig which holds another surface of said abutment portion so that said groove (note, groove is interpreted as an opening) of said backing jig covers said abutment portion therewith (see Smith, Figure 1 and 2, Page 1, line 25 to page 2, line 75); welding the joining members and fusing (note, fusing is interpreted by the examiner as deforming) at least a portion of the buffer member during welding; protruding welding metal unto said buffer member; disengaging only the said backing jig from the abutment portion while said buffer member is secured to an other surface of said abutment portion after performing a friction stir welding; disengaging said buffer member from said other surface of said abutment portion; and removing said protruding portion from said abutment portion toward said opening (see page 2, lines 5 - 75).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have provided the backing jig of Colligan as modified by Franklin et al. with a buffer member attached thereto in view of the teachings of Smith to prevent the weld metal from immediately contacting the backing jig which detrimentally affects the integrity of joint formed (page 1, lines 5 -55 and page 2, lines 20 -75).

8. Claims 7 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Colligan (US Patent no. 5769306) in view of Franklin et al. and Smith; and in further in view of Colligan (US 2002/0142183 A1).

Colligan (US Patent no. 5769306) in view of Franklin et al. and further in view of Smith disclose and/or suggest all the elements of claims 1, 21 and 23 but do not

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expressly disclose that said first plate member and said second plate member has a thickness of not more than 2 mm.

However Colligan (US 2002/0142183 A1) discloses friction stir welding of a 1.5mm plate with a probe of diameter of 1.5 mm; that ideally the diameter of the probe should be about as wide as the thickness of the plates to be welded (see [0006]).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have applied the method of Colligan (US Patent no. 5769306) as modified by Franklin et al. and Smith; and further in view of Colligan (US 2002/0142183 A1) to have selected a probe of about 2mm wide in diameter to enable friction stir weld plates of not more than 2 mm thick (US 2002/0142183; [0006]).

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure Planett (US 2380071), Litwinski et al. (US 6257479) and Enomoto et al. (US 5979742) are cited of interest for illustrating the state of art of friction stir welding and backing devices.


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael Aboagye whose telephone number is 571-272-8165. The examiner can normally be reached on Mon - Fri 8:30am - 5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thomas Dunn can be reached on 571-272-1171. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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Michael Aboagye
Assistant examiner
Art Unit 1725

9/7/2005

KEVIN KERNS
PRIMARY EXAMINER

Kevin Kerns 9/7/05